53-1000854-07
9 January 2015

Brocade 5100

Hardware Installation Guide

BROCADE

Contents

Preface

Document conventions

The document conventions describe text formatting conventions, command syntax conventions, and important notice formats used in Brocade technical documentation.

Text formatting conventions

Text formatting conventions such as boldface, italic, or Courier font may be used in the flow of the text to highlight specific words or phrases.

Format	Description
bold text	Identifies command names
	Identifies keywords and operands
	Identifies the names of user-manipulated GUI elements
	Identifies text to enter at the GUI
italic text	Identifies emphasis
	Identifies variables and modifiers
	Identifies paths and Internet addresses
	Identifies document titles
`Courier font`	Identifies CLI output
	Identifies command syntax examples

Command syntax conventions

Bold and italic text identify command syntax components. Delimiters and operators define groupings of parameters and their logical relationships.

Convention	Description
bold text	Identifies command names, keywords, and command options.
italic text	Identifies a variable.

Convention	Description
value	In Fibre Channel products, a fixed value provided as input to a command option is printed in plain text, for example, **--show** WWN.
[ ]	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
{ **x** | **y** | **z** }	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options. In Fibre Channel products, square brackets may be used instead for this purpose.
x | **y**	A vertical bar separates mutually exclusive elements.
< >	Nonprinting characters, for example, passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, *member*[*member*...].
\	Indicates a “soft” line break in command examples. If a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

Notes, cautions, and warnings

Notes, cautions, and warning statements may be used in this document. They are listed in the order of increasing severity of potential hazards.

NOTE
A Note provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

ATTENTION
An Attention statement indicates a stronger note, for example, to alert you when traffic might be interrupted or the device might reboot.

CAUTION

A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

DANGER

A Danger statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Brocade resources

Visit the Brocade website to locate related documentation for your product and additional Brocade resources.

You can download additional publications supporting your product at www.brocade.com. Select the Brocade Products tab to locate your product, then click the Brocade product name or image to open the individual product page. The user manuals are available in the resources module at the bottom of the page under the Documentation category.

To get up-to-the-minute information on Brocade products and resources, go to MyBrocade. You can register at no cost to obtain a user ID and password.

Release notes are available on MyBrocade under Product Downloads.

White papers, online demonstrations, and data sheets are available through the Brocade website.

Contacting Brocade Technical Support

As a Brocade customer, you can contact Brocade Technical Support 24x7 online, by telephone, or by e-mail. Brocade OEM customers contact their OEM/Solutions provider.

Brocade customers

For product support information and the latest information on contacting the Technical Assistance Center, go to http://www.brocade.com/services-support/index.html.

If you have purchased Brocade product support directly from Brocade, use one of the following methods to contact the Brocade Technical Assistance Center 24x7.

Online	Telephone	E-mail
Preferred method of contact for non-urgent issues: • My Cases through MyBrocade • Software downloads and licensing tools • Knowledge Base	Required for Sev 1-Critical and Sev 2-High issues: • Continental US: 1-800-752-8061 • Europe, Middle East, Africa, and Asia Pacific: +800-AT FIBREE (+800 28 34 27 33) • For areas unable to access toll free number: +1-408-333-6061 • Toll-free numbers are available in many countries.	support@brocade.com Please include: • Problem summary • Serial number • Installation details • Environment description

Brocade OEM customers

If you have purchased Brocade product support from a Brocade OEM/Solution Provider, contact your OEM/Solution Provider for all of your product support needs.

- OEM/Solution Providers are trained and certified by Brocade to support Brocade® products.
- Brocade provides backline support for issues that cannot be resolved by the OEM/Solution Provider.

- Brocade Supplemental Support augments your existing OEM support contract, providing direct access to Brocade expertise. For more information, contact Brocade or your OEM.
- For questions regarding service levels and response times, contact your OEM/Solution Provider.

Document feedback

To send feedback and report errors in the documentation you can use the feedback form posted with the document or you can e-mail the documentation team.

Quality is our first concern at Brocade and we have made every effort to ensure the accuracy and completeness of this document. However, if you find an error or an omission, or you think that a topic needs further development, we want to hear from you. You can provide feedback in two ways:

- Through the online feedback form in the HTML documents posted on www.brocade.com.
- By sending your feedback to documentation@brocade.com.

Provide the publication title, part number, and as much detail as possible, including the topic heading and page number if applicable, as well as your suggestions for improvement.

About This Document

Supported hardware and software

Although many different software and hardware configurations are tested and supported by Brocade Communications Systems, Inc. for Fabric OS v6.1.0, documenting all possible configurations and scenarios is beyond the scope of this document.

This document is specific to the Brocade 5100 and Fabric OS v6.1.0. To obtain information about a Fabric OS version other than v6.1.0, see the documentation specific to that OS version.

What's new in this document

- An illustration indicating the port numbers and the port groups is added.
- A chapter on removal and replacement of power supplies and fan assemblies is added.
- All references to EIA cabinet have been changed to EIA rack since closed cabinets are not supported by Brocade products.
- The regulatory compliance statements are moved to a new chapter/appendix.
    - China CCC certification has been updated from "GB17625.1-2003 or latest" to "GB17625.1-2012 or latest".
    - Laser compliance statement is removed.
    - The Japan VCCI statement has been updated.
    - China RoHS compliance statements are removed and a reference to the latest independent China RoHS compliance document is added.
- A new chapter/appendix on cautions and danger notices is added with translation in multiple languages.

Brocade 5100 Introduction

Brocade 5100 overview

The Brocade 5100 is an Enterprise class 1U, 40-port Fibre Channel 1, 2, 4 or 8 Gbps Fibre Channel switch that offers the next generation Brocade, single-chip architecture for Storage Area Networks (SANs). The Brocade 5100 is designed to function in large-scale enterprise SANs and can also fit the requirements of small to medium-sized work groups.

Because the Brocade 5100 has a slim 1U height and a high port count, you can use the Brocade 5100 to create very dense fabrics in a relatively small space. With its flexible Ports On Demand (POD) capability, the Brocade 5100 provides excellent overall value as the foundation of a SAN with the ability to grow with an organization's SAN needs.

The Brocade 5100 is the latest mid-range offer from the Brocade family of entry-to-enterprise products. It supports the following features:

- Up to 40 ports of high-performance 8 Gbps technology and POD scaling from 24 to 32 or 40 ports.
- Support for 1, 2, 4, and 8 Gbps auto-sensing Fibre Channel switch and router ports.
- FICON®, FICON Cascading and FICON Control Unit Port ready.
- Two hot-swappable, redundant integrated power supply and fan FRUs.
- Universal ports that self-configure as E, F, M, or FL ports. Ex_Ports are activated on a per port basis with the optional Integrated Routing license.
- Fibre Channel Routing (FCR) service that provides improved scalability and fault isolation (through the optional Integrated Routing license).
- An RJ45 Ethernet management port, that in conjunction with EZSwitchSetup, supports switch IP address discovery and configuration, eliminating the need to attach a serial cable to configure the switch IP address and greatly increasing the ease of use.
- USB port that provides storage for firmware updates, output of the **supportSave** command and storage for configuration uploads and downloads
- Single motherboard design with 667 MHz PowerPC 440EPx Reduced Instruction Set Computer (RISC) CPU and integrated peripherals which provide high performance.
- Inter-Switch Link (ISL) Trunking (licensable), which allows up to eight ports (at 1, 2, 4, or 8 Gbps speeds) between a pair of switches combined to form a single, logical ISL with a speed of up to 128 Gbps full duplex for optimal bandwidth utilization and load balancing.
- Dynamic Path Selection (DPS), which optimizes fabric-wide performance and load balancing by automatically routing data to the most efficient available path in the fabric.
- Rack-mount design using existing rail kits (fixed, sliding, and mid-mount/Telco rail kits) on a 19" EIA rack.

- Industry-leading extended distance support, which enables native Fibre Channel extension greater than 590 km.
- Expanded security for up to 16,000 hardware zones. Hardware zoning is accomplished at the port level of the switch or by World Wide Name (WWN). Hardware zoning permits or denies delivery of frames to any destination port address.
- Unicast, multicast (255 groups), and broadcast data traffic type, are support.
- Brocade Small Form-Factor Pluggable (SFP) or SFP+ optical transceivers support any combination of Short Wavelength (SWL), Long Wavelength (LWL) or Extended Long Wavelength (ELWL) optical media among the switch ports.
- Brocade Fabric Operating System (Fabric OS), which delivers distributed intelligence throughout the network and enables a wide range of value-added applications including Brocade Advanced Web Tools and Brocade Zoning. Optional Fabric Services include: Adaptive Networking with QoS, Brocade Extended Fabrics, Brocade Enhanced Group Management, Brocade Fabric Watch, ISL Trunking, Integrated Routing, and End-to-End Performance Monitoring (APM).
- Port-to-port latency minimized to 700 nanoseconds through the use of cut-through frame routing at 8 Gbps.
- Extensive diagnostics and system monitoring capabilities, which enhance high Reliability, Availability, and Serviceability (RAS).
- The Brocade EZSwitchSetup wizard, which makes SAN configuration a three-step point-and click task.

Facility requirements

The following table provides the facilities requirements that must be met for the Brocade 5100.

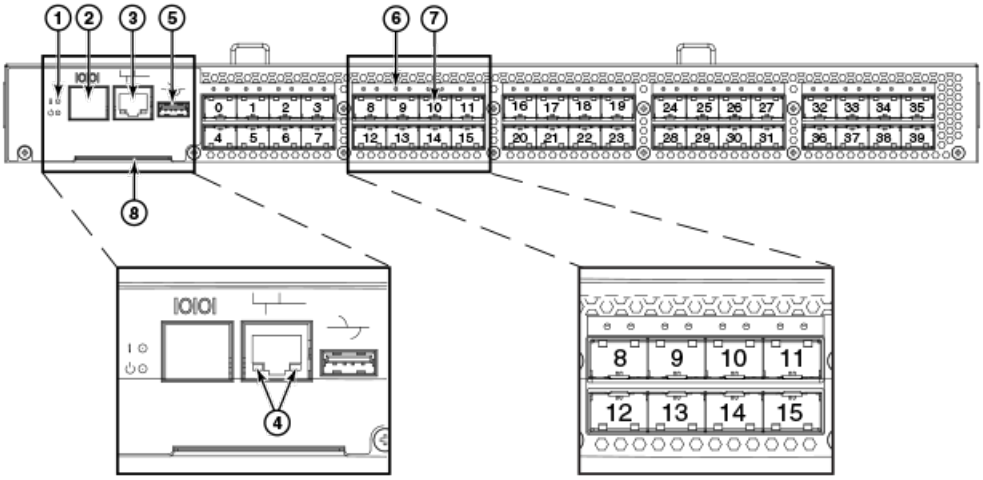
TABLE 1 Facility Requirements

Type	Requirements
Electrical	• Primary AC input 100-240 VAC, 2.0A, 47-63 Hz; switch autosenses input voltage • Adequate supply circuit, line fusing, and wire size, as specified by the electrical rating on the switch nameplate • Circuit protected by a circuit breaker and grounded in accordance with local electrical codes Refer to GUID-2965C97E-D67D-4F0A-8461-4C96C8CB0654#GUID-2965C97E-D67D-4F0A-8461-4C96C8CB0654 for complete power supply specifications.
Thermal	• A minimum air flow of 79.8 cubic meters/hour (47 cubic ft/min.) available in the immediate vicinity of the switch • Ambient air temperature not exceeding 40 ° C (104 ° F) while the switch is operating
Rack (when rack-mounted)	• One rack unit (1U) in a 48.3 cm (19-inch) rack • All equipment in rack grounded through a reliable branch circuit connection • Additional weight of switch not to exceed the rack's weight limits • Rack secured to ensure stability in case of unexpected movement

Port side of the Brocade 5100

The port side of the Brocade 5100 includes the system status LED, console port, Ethernet port and LEDs, USB port, and Fibre Channel ports and the corresponding port status LEDs.

FIGURE 1 Port-side view of the Brocade 5100

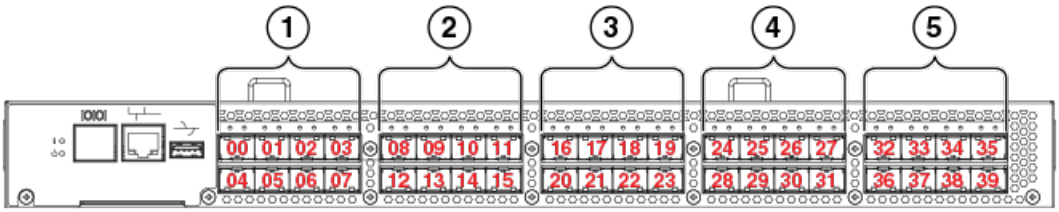


1. System status (top) and power (bottom) LEDs
2. System RS232 console port (RJ-45)
3. System Ethernet port (RJ-45)
4. Ethernet port LEDs (green/amber)
5. USB port
6. Fibre Channel port status LED
7. Fibre Channel ports
8. Switch ID pull-out tab

Port Numbering

The Fibre Channel ports on the Brocade 5100 are numbered from left to right, in eight-port groups from 0 to 39 as illustrated in the following figure.

FIGURE 2 Trunking port groups and port numbers of the Brocade 5100



1. Trunking port group 1; FC ports 00-07
2. Trunking port group 1; FC ports 08-15
3. Trunking port group 1; FC ports 16-23

4. Trunking port group 1; FC ports 24-31
5. Trunking port group 1; FC ports 32-39

NOTE
You can also use port index and PIDs to identify a port. For more information, refer to the *Fabric OS Administrator's Guide*

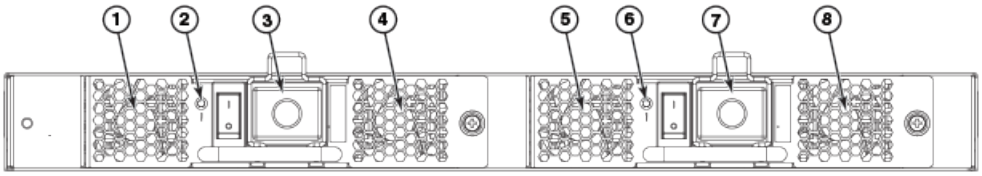
NOTE

Brocade ISL Trunking is licensed software that allows you to create trunking groups of ISLs between adjacent switches. Trunking is supported by combining maximum of eight ports per group to form 64-Gbps ISL trunk. The trunking port groups are 0-7, 8-15, 16-23, 24-31, and 32-39. For more information about Brocade ISL Trunking, refer to the *Brocade Fabric OS Administrator's Guide*.

Non-port side of the Brocade 5100

The non-port side of the Brocade 5100 includes the two redundant power supply-fan assemblies and the corresponding status LEDs.

FIGURE 3 Non-port side view of the Brocade 5100



1. Fan (for power supply/fan FRU2)
2. Power supply/Fan status LED (for power supply/fan FRU 2)
3. Power supply connector (for power supply/fan FRU2)
4. Fan (for power supply/fan FRU2)
5. Fan (for power supply/fan FRU1)
6. Power supply/Fan status LED (for Power Supply/fan FRU 1)
7. Power supply connector (for power supply/fan FRU 1)
8. Fan (for power supply/fan FRU1)

Field replaceable units (FRUs)

The Brocade 5100 has two integrated power supply and fan unit field replaceable units (FRUs). These power supply/fan assembly units are hot-swappable and redundant, and are capable of functioning universally without voltage jumpers or switches. The FRU units are identical and interchangeable.

The front panel has a status LED that provides the status of the entire switch, including the two power supply/fan assembly FRUs.

Ports on Demand license

The Brocade 5100 has 40 ports. By default, ports 0-24 are enabled. To enable additional ports, you must install Ports On Demand (POD) licenses.

To install a POD license, you can either use the supplied license key or generate a license key. Typically the switch is shipped with a paper pack that specifies the transaction key to use with the Software License Keys link. Use this transaction key on the Brocade Web site at *www.brocade.com* / *licensekeys* and follow the instructions to generate the key. You can also use this site to generate other license keys for your switch.

After you have installed the license keys, you must enable the ports. You can do so without disrupting switch operation by using the **portEnable** command on each port individually. Alternatively, you can disable and re-enable the switch to activate all ports simultaneously.

For detailed information on enabling additional ports using the POD license, refer to the *Fabric OS Administrator's Guide*

ISL trunking groups

The Brocade 5100 supports Interswitch Link (ISL) Trunking as a licensed feature. When this feature is enabled, you can create trunked groups of up to eight contiguous ports, permitting a speed of up to 64 Gbps (128 Gbps full duplex).

NOTE
Brocade ISL Trunking is licensed software that allows you to create trunking groups of ISLs between adjacent switches. For more information about Brocade ISL Trunking, refer to the *Brocade Fabric OS Administrator's Guide*

Brocade 5100 Installation and Configuration

Installation and safety considerations

You can install the Brocade 5100 switch in the following ways:

1. As a standalone unit on a flat surface.
2. In an EIA rack using a fixed-rail rack mount kit. The optional fixed-rail rack mount kit can be ordered from your switch retailer.
3. In an EIA rack using an optional slide-rail rack mount kit. The optional slide-rail rack mount kit can be ordered from your switch retailer. When mounting into a slide-rail rack, you can mount the chassis to slide from either the port side or the non-port side.
4. In an EIA rack using an optional mid-mount rack kit for switches. The optional mid-mount rack kit for switches can be ordered from your switch retailer.

General precautions

When using this product, observe all danger, caution, and attention notices in this manual. The notices are accompanied by symbols that represent the severity of the safety condition.

NOTE
Refer to Cautions and Danger Notices on page 49 for translations of safety notices for this product.

DANGER
The procedures in this manual are for qualified service personnel.

CAUTION
Changes or modifications made to this device that are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

ESD precautions

This product contains electrostatic discharge (ESD) sensitive field-replacable units (FRUs) When working with any FRU, use correct ESD procedures.

CAUTION

Before plugging a cable into to any port, be sure to discharge the voltage stored on the cable by touching the electrical contacts to ground surface.

CAUTION

Static electricity can damage the chassis and other electronic devices. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

Wear a wrist grounding strap connected to chassis ground (if the device is plugged in) or a bench ground.

DANGER

For safety reasons, the ESD wrist strap should contain a series 1 megaohm resistor.

Power precautions

To install and operate the switch successfully, ensure the following:

- The primary outlet is correctly wired, protected by a circuit breaker, and grounded in accordance with local electrical codes.

DANGER

Make sure that the power source circuits are properly grounded, then use the power cord supplied with the device to connect it to the power source.

- The supply circuit, line fusing, and wire size are adequate, as specified by the electrical rating on the switch nameplate.
- This switch might have more than one power cord. To reduce the risk of electric shock, disconnect both power cords before servicing.

DANGER

Remove both power cords before servicing.

DANGER

Disconnect the power cord from all power sources to completely remove power from the device.

- This product is designed for an IT power system with phase-to-phase voltage of 230V. After operation of the protective device, the equipment is still under voltage if it is connected to an IT power system.

DANGER

To avoid high voltage shock, do not open the device while the power is on.

- The power supply standards provided in "Power Supply Specifications" are met.

RTC battery precautions

Do not attempt to replace the real-time clock (RTC) battery. There is danger of explosion if the battery is incorrectly replaced or disposed of. Contact your switch supplier if the real-time clock begins to lose time.

DANGER

Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

Environmental considerations

For successful installation and operation of the switch, ensure that the following environmental requirements are met:

- At a minimum, adequate cooling requires that you install the switch with the non-port side, which contains the air intake vents, facing the cool-air aisle.
- All equipment in the rack should force air in the same direction to avoid intake of exhaust air.

CAUTION

Ensure that the airflow direction of the power supply unit matches that of the installed fan tray. The power supplies and fan trays are clearly labeled with either a green arrow with an "E", or an orange arrow with an "I."

- A maximum of 49.3 cubic meters/hour (29 cubic feet/minute) and a minimum of 37.4 cubic meters/hour (22 cubic feet/minute) of air flow is available to the air intake vents on the non-port side of the switch.

CAUTION

Make sure the airflow around the front, sides, and back of the device is not restricted.

- Ensure that temperature requirements are met.

CAUTION

Do not install the device in an environment where the operating ambient temperature might exceed 40°C (104°F).

EIA rack considerations

For successful installation and operation of the switch in a EIA rack, ensure the following requirements are met:

- The rack must be a standard EIA rack.
- Plan a rack space that is one rack unit (1U) high; 4.45 cm (1.75 inches) and 48.3 cm (19 inches) wide.
- Ground all equipment in the rack through a reliable branch circuit connection and maintain ground at all times. Do not rely on a secondary connection to a branch circuit, such as a power strip.
- Ensure that airflow and temperature requirements are met on an ongoing basis, particularly if the switch is installed in a closed or multi-rack assembly.
- Verify that the additional weight of the switch does not exceed the rack's weight limits or unbalance the rack in any way.
- Secure the rack to ensure stability in case of unexpected movement, such as an earthquake.

DANGER

Make sure the rack housing the device is adequately secured to prevent it from becoming unstable or falling over.

Recommendations for cable management

The minimum bend radius for a 50 micron cable is 2 inches under full tensile load and 1.2 inches with no tensile load.

Cables can be organized and managed in a variety of ways, for example, using cable channels on the sides of the rack or patch panels to minimize cable management. Following is a list of recommendations:

NOTE
You should not use tie wraps with optical cables because they are easy to over tighten.

CAUTION
Before plugging a cable into to any port, be sure to discharge the voltage stored on the cable by touching the electrical contacts to ground surface.

- Plan for rack space required for cable management before installing the switch.
- Leave at least 1 m (3.28 ft) of slack for each port cable. This provides room to remove and replace the switch, allows for inadvertent movement of the rack, and helps prevent the cables from being bent to less than the minimum bend radius.
- If you are using Brocade ISL Trunking, consider grouping cables by trunking groups. The cables used in trunking groups must meet specific requirements, as described in the *Fabric OS Administrator's Guide* .
- For easier maintenance, label the fiber optic cables and record the devices to which they are connected.
- Keep LEDs visible by routing port cables and other cables away from the LEDs.
- Use hook and loop style straps to secure and organize fiber optic cables.

Items required for installation

The following items are required for installing, configuring, and connecting the Brocade 5100 for use in a network and fabric:

- Workstation with an installed terminal emulator, such as HyperTerminal
- Unused IP address and corresponding subnet mask and gateway address
- Serial cable (provided)
- Ethernet cable
- SFPs and compatible cables, as required
- Access to an FTP server for backing up the switch configuration (optional)

Items included with the Brocade 5100

The following items are included with the standard shipment of the Brocade 5100. When you open the Brocade 5100 packaging, verify that these items are included in the package and that no damage has occurred during shipping:

- The Brocade 5100 switch, containing two power supply/fan assembly units
- One accessory kit containing:
  - Serial Cable with an RJ-45 connector
  - 6 ft. Power Cord

- Rubber feet, required for setting up the switch as a standalone unit
- Brocade 5100 QuickStart Guide
- EZSwitchSetup CD

Installing a standalone Brocade 5100

Perform this task to install the Brocade 5100 as a standalone unit.

1. Unpack the Brocade 5100 and verify the items listed on Items included with the Brocade 5100 on page 20. Verify the items are present and undamaged.
2. Apply the adhesive rubber feet. Applying the rubber feet onto the switch helps prevent the switch from sliding off the supporting surface.
   a) Clean the indentations at each corner of the bottom of the switch to ensure that they are free of dust or other debris that might lessen the adhesion of the feet.
   b) With the adhesive side against the chassis, place one rubber foot in each indentation and press into place.
3. Place the switch on a flat, sturdy surface.
4. Provide power to the switch as described in Providing power to the switch on page 22.

NOTE

Do not connect the switch to the network until the IP address is correctly set. For instructions on how to set the IP address, see Brocade 5100 configuration on page 22

Rack installation for a Brocade 5100

You must use one of three rack mount kits to install a Brocade 5100 in a EIA rack. A rack mount kit can be installed in two ways:

- To allow the port side of the switch to slide out of the exhaust-air side of the rack. In this installation, the port side of the switch is flush with the edge of the rack.
- To allow the non-port side of the switch to slide out the cool-air side of the rack. In this installation, the port side of the switch is set 7.62 cm (3 inches) back from the edge of the rack, allowing a more gradual bend in the fiber optic cables.

Whichever mounting method you choose, follow the installation instructions shipped with the appropriate rack mount kit:

- To install the switch into a fixed-rail rack, refer to the *Fixed Rack Mount Kit Installation Procedure*.
- To install the switch into a slide-rail rack, refer to the *Slide Rack Mount Kit Installation Procedure*.
- To install the switch into mid-mount rack, refer to the *Mid-Mount Rack Mount Kit (Switch) Installation Procedure*.

Brocade 5100 configuration

Once you have set up the Brocade 5100 in a rack or as a standalone switch, it is time to give it power and a basic configuration. If you are going to use the Brocade 5100 in a single-switch setup, you can use EZSwitchSetup to complete the basic configuration.

See the *EZSwitchSetup CD* , included with the Brocade 5100 for more information. You can also use the Brocade 5100 *Quick Start Guide* .

If you do not want to use EZSwitchSetup, follow the instructions in the rest of this section.

Providing power to the switch

Perform the following steps to provide power to the Brocade 5100.

1. Connect the power cords to both power supplies, and then to power sources on separate circuits to protect against AC failure. Ensure that the cords have a minimum service loop of 6 in. available and are routed to avoid stress.
2. Power on the power supplies by flipping both AC switches to the "1" symbol. The power supply LEDs display amber until POST is complete, and then change to green. The switch usually requires from 1 to 3 min to boot and complete POST.

NOTE

Power is supplied to the switch as soon as the first power supply is connected and turned on.

3. After POST is complete, verify that the switch power and status LEDs on the left of the port side of the switch are green.

Creating a serial connection

You will perform all basic configuration tasks in this guide using a serial connection.

Complete the following steps to create a serial connection to the switch.

1. Connect the serial cable to the serial port on the switch and to an RS-232 serial port on the workstation.

   If the serial port on the workstation is RJ-45 instead of RS-232, remove the adapter on the end of the serial cable and insert the exposed RJ-45 connector into the RJ-45 serial port on the workstation.
2. Open a terminal emulator application (such as HyperTerminal on a PC, or TERM, TIP, or Kermit in a UNIX environment), and configure the application as follows:
   - In a Windows environment:

Parameter	Value
Bits per second	9600
Databits	8
Parity	None

Parameter	Value
Stop bits	1
Flow control	None

- In a UNIX environment, enter the following string at the prompt:

  ```
  tip /dev/ttyb -9600
  ```

  If ttyb is already in use, use ttya instead and enter the following string at the prompt:

  ```
  tip /dev/ttya -9600
  ```

Switch IP address

You can configure the Brocade 5100 with a static IP address, or you can use a DHCP (Dynamic Host Configuration Protocol) server to set the IP address of the switch. DHCP is enabled by default. The Brocade 5100 supports both IPv4 and IPv6.

Using DHCP to set the IP address

When using DHCP, the Brocade 5100 obtains its IP address, subnet mask, and default gateway address from the DHCP server. The DHCP client can only connect to a DHCP server that is on the same subnet as the switch. If your DHCP server is not on the same subnet as the Brocade 5100, use a static IP address.

Setting a static IP address

Perform the following steps to set a static IP address on the switch.

1. Log into the switch using the default password, which is password.
2. Use the **ipaddrset** command to set the Ethernet IP address.

   If you are going to use an IPv4 IP address, enter the IP address in dotted decimal notation as prompted.

   ```
   Ethernet IP Address: [192.168.74.102]
   ```

   If you are going to use an IPv6 address, enter the network information in semicolon-separated notation as prompted.

   ```
   switch:admin> ipaddrset -ipv6 --add 1080::8:800:200C:417A/64
   IP address is being changed...Done.
   ```
3. Complete the rest of the network information as prompted.

   ```
   Ethernet Subnetmask: [255.255.255.0]
   Ethernet IP Address: [192.168.74.102]
   Ethernet Subnetmask: [255.255.255.0]
   ```
4. Enter off to Disable DHCP when prompted.

   ```
   DHCP [OFF]: off
   ```

Date and time settings

The Brocade 5100 maintains the current date and time inside a battery-backed real-time clock (RTC) circuit. Date and time are used for logging events. Switch operation does not depend on the date and time; a Brocade 5100 with an incorrect date and time value still functions properly. However, because the date and time are used for logging, error detection, and troubleshooting, you should set them correctly.

Time zones

You can set the time zone for the switch by name. You can also set country, city or time zone parameters.

If the time zone is not set with the new options, the switch retains the offset time zone settings. The **tsTimeZone** command includes an option to revert to the prior time zone format. For more information about the **--old** option, see the *Fabric OS Command Reference*.

You can set the time zone for a switch using the **tsTimeZone** command. The **tsTimeZone** command allows you to perform the following tasks:

- Display all of the time zones supported in the firmware
- Set the time zone based on a country and city combination or based on a time zone ID such as PST

The time zone setting has the following characteristics:

- You can view the time zone settings. However, only those with administrative permissions can set the time zones.
- The **tsTimeZone** setting automatically adjusts for Daylight Savings Time.
- Changing the time zone on a switch updates the local time zone setup and is reflected in local time calculations.
- By default, all switches are in the GMT time zone (0,0). If all switches in a fabric are in one time zone, it is possible for you to keep the time zone setup at the default setting.
- System services that have already started will reflect the time zone changes only after the next reboot.
- Time zone settings persist across failover for high availability.

Local time synchronization

You can synchronize the local time of the principal or primary fabric configuration server (FCS) switch to a maximum of eight external network time protocol (NTP) servers. To keep the time in your SAN current, it is recommended that the principal or primary FCS switch has its time synchronized with at least one external NTP server. The other switches in the fabric will automatically take their time from the principal or primary FCS switch.

All switches in the fabric maintain the current clock server value in non-volatile memory. By default, this value is the local clock server <LOCL> of the principal or primary FCS switch. Changes to the clock server value on the principal or primary FCS switch are propagated to all switches in the fabric.

When a new switch enters the fabric, the time server daemon of the principal or primary FCS switch sends out the addresses of all existing clock servers and the time to the new switch. If a switch with v5.3.0 or later has entered the fabric it will be able to store the list and the active servers; pre-5.3.0 Fabric OS switches will ignore the new list parameter in the payload and will update only the active server address.

If the active NTP server configured is IPv6, then distributing the same in the fabric will not be possible to switches earlier than v5.3.0 because IPv6 is supported for Fabric OS version 5.3.0 and later. The default value LOCL will be distributed to pre-5.3.0 switches.

The **tsClockServer** command accepts multiple server addresses in either IPv4, IPv6, or DNS name formats. When multiple NTP server addresses are passed, **tsclockserver** sets the first obtainable address as the active NTP server. The rest are stored as backup servers that can take over if the active NTP server fails. The principal or primary FCS switch synchronizes its time with the NTP server every 64 seconds.

Setting the date

Perform the following steps to set the date on the switch.

1. Log into the switch using the default password, which is password.
2. Enter the **date** command, using the following syntax:

   ```
   date "mmddHHMMyy"
   ```

   The values are:

   - mm is the month; valid values are 01 through 12.
   - dd is the date; valid values are 01 through 31.
   - HH is the hour; valid values are 00 through 23.
   - MM is minutes; valid values are 00 through 59.
   - yy is the year; valid values are 00 through 99 (values greater than 69 are interpreted as 1970 through 1999, and values less than 70 are interpreted as 2000-2069).

```
switch:admin> date
Fri Sep 29 17:01:48 UTC 2007
switch:admin> date "0927123007"
Thu Sep 27 12:30:00 UTC 2007
switch:admin>
```

Setting time zones

You must perform the procedure on *all* switches for which the time zone must be set. However, you only need to set the time zone once on each switch, because the value is written to nonvolatile memory.

Use one of the two following procedures to set the time zone.

The following procedure describes how to set the current time zone using timezone_fmt mode to Central Standard time.

1. Log into the switch using the default password, which is password.
2. Enter the **tsTimeZone** command as follows:

   ```
   switch:admin> tstimezone [--interactive]/ [, timezone_fmt]
   ```

   Use **timezone_fmt** to set the time zone by Country/City or by time zone ID, such as PST.

   The following example shows how to change the time zone to US/Central.

```
switch:admin> tstimezone
Time Zone : US/Pacific
switch:admin> tstimezone US/Central
switch:admin> tstimezone
Time Zone : US/Central
```

The following procedure describes how to set the current time zone using interactive mode to Pacific Standard Time.

1. Type the **tsTimeZone** command as follows:
   ```
   switch:admin> tstimezone --interactive
   ```
2. You are prompted to select a general location.
   ```
   Please identify a location so that time zone rules can be set correctly.
   ```
3. Enter the appropriate **number** or **Ctrl-D** to quit.
4. At the prompt, select a **country location**.
5. At the prompt, enter the appropriate **number** to specify the time zone region or **Ctrl-D** to quit.

Synchronizing local time using NTP

Perform the following steps to synchronize the local time using NTP.

1. Log into the switch using the default password, which is password.
2. Enter the **tsClockServer** command:

   ```
   switch:admin> tsclockserver "<ntp1;ntp2>"
   ```

   where **ntp1** is the IP address or DNS name of the first NTP server, which the switch must be able to access. The second **ntp2** is the second NTP server and is optional. The operand "<ntp1;ntp2>" is optional; by default, this value is LOCL, which uses the local clock of the principal or primary switch as the clock server.

   ```
   switch:admin> tsclockserver
   LOCL
   switch:admin> tsclockserver "132.163.135.131"

   switch:admin> tsclockserver
   132.163.135.131
   switch:admin>
   ```

   The following example shows how to set up more than one NTP server using a DNS name:

   ```
   switch:admin> tsclockserver
    "10.32.170.1;10.32.170.2;ntp.localdomain.net"
   Updating Clock Server configuration...done.
   Updated with the NTP servers
   Changes to the clock server value on the principal or primary FCS switch are
   propagated to all switches in the fabric
   ```

Brocade 5100 Operation

Powering the Brocade 5100 on and off

To power the Brocade 5100 on, connect one or both power cords to the power connectors on the power supplies and to a power source; then, set the AC power switches to "I". Power is supplied to the switch as soon as the first power supply is connected and powered on.

The switch runs POST by default each time it is powered on; it can take up to several minutes to boot and complete POST.

To power the Brocade 5100 off, power off both power supplies by setting each AC power switch to "O". All devices are returned to their initial state the next time the switch is powered on.

LED activity interpretation

System activity and status can be determined through the activity of the LEDs on the switch. There are three possible LED states: no light, a steady light, and a flashing light. The lights are green or amber.

Sometimes, the LEDs flash either of the colors during boot, POST, or other diagnostic tests. This is normal; it does not indicate a problem unless the LEDs do not indicate a healthy state after all boot processes and diagnostic tests are complete.

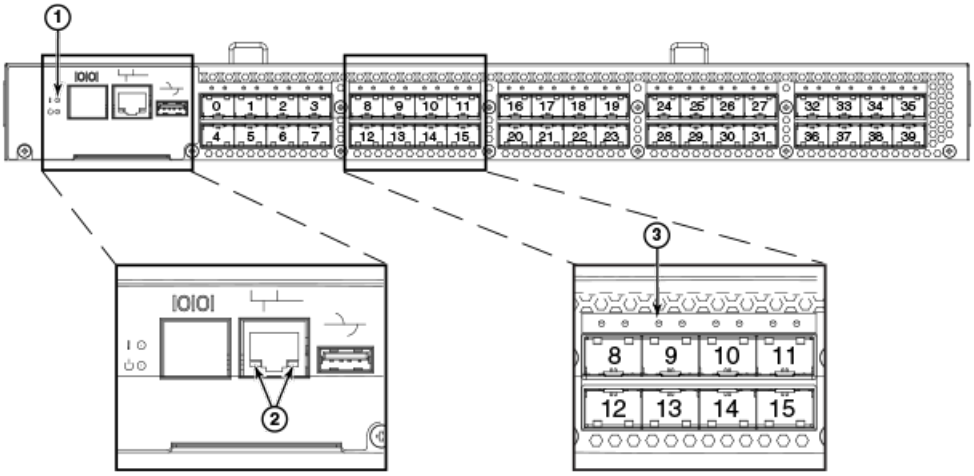
Brocade 5100 LEDs

The Brocade 5100 has the following LEDs:

- One system status LED (above) on the left side
- One power status LED (below) on the left side
- 40 port status LEDs, one for each Fibre Channel port, located above the ports
- One power supply status LED on each power supply FRU, to the left of the ON/OFF rocker switch on the non-port side of the switch

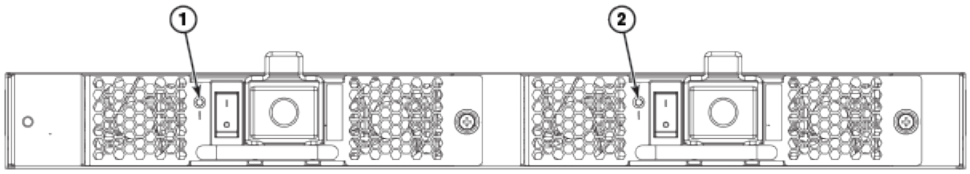
LED locations

FIGURE 4 Port Side LEDs on the Brocade 5100.



1. System status LED (top) and System power (bottom)
2. Ethernet port Status LEDs (green/amber)
3. FC port status (port 9)

FIGURE 5 Non-Port Side LEDs on the Brocade 5100.



1. Power supply status LED
2. Power supply status LED

LED Patterns

The following table describes the LEDs and their actions on the switch.

TABLE 2 Brocade 5100 LED Patterns During Normal Operation

LED Name	LED Color	Status of Hardware	Recommended Action
Power Supply Status	No light	Primary power cord is disconnected or is not actively powered, or power supply has failed.	Verify the power supply is on and seated and the power cord is connected to a functioning power source.
	Steady green	Power supply is operating normally.	No action required.

TABLE 2 Brocade 5100 LED Patterns During Normal Operation (Continued)

LED Name	LED Color	Status of Hardware	Recommended Action
	Flashing green (for more than five seconds)	A power supply and fan assembly fault has occurred for one of the following reasons: • The power supply or fan in the assembly has failed. • The FRU was disabled by a user. • The FRU power switch has been turned off or the unit has been unplugged.	Take one of the following actions: • Replace the FRU • Verify that the power supply/fan assembly FRU is enabled • Check the power switch and plug
Power Status	No light	System is off or there is an internal power supply failure.	Verify the system is on. If the system is on, the unit is faulty. Contact Technical Support.
	Steady green	System is on and power supplies are functioning properly.	No action required.
System Status	No light	System is off, boot is not complete, or boot failed.	Verify the system is on and has completed booting.
	Steady green	System is on and power supplies are functioning properly.	No action required.
	Steady amber (for more than five seconds)	Boot failed, the system is faulty.	Perform the following steps: Connect a serial cable to the system. Reboot the system. Check the failure indicated on the system console. Contact Technical Support.
	Flashing amber/ green	Attention is required. A number of variables can cause this status including a single power supply failure, a fan failure, or one or more environmental ranges has exceeded.	Check the management interface and the error log for details on the cause of status. Contact Technical Support if required.
Ethernet Speed	No light	Port speed is 10 Mbps.	No action required.
	Steady green	Port speed is 100 Mbps.	No action required.
Ethernet Link	No light	There is no link.	Verify the Ethernet cable is connected correctly.
	Steady amber	There is a link.	No action required.
	Flickering amber	There is link activity (traffic).	No action required.
Port Status	No light	No signal or light carrier (media or cable) detected.	Check transceiver and cable.

TABLE 2 Brocade 5100 LED Patterns During Normal Operation (Continued)

LED Name	LED Color	Status of Hardware	Recommended Action
	Slow flashing green (flashing in two-second intervals)	Port is online but segmented because of a loopback cable or incompatible switch connection.	No action required.
	Fast flashing green (flashing in half-second intervals)	Port is online and an internal loopback diagnostic test is running.	No action required.
	Flickering green (steady with random flashes)	Port is online and frames are flowing through the port.	No action required.
	Steady green	Port is online (connected to external device) but has no traffic.	No action required.
	Slow flashing amber (flashing in two-second intervals)	Port is disabled (because of diagnostics or the **portDisable** command).	Verify the diagnostic tests are not running. Reenable the port using the **portEnable** command.
	Fast flashing amber (flashing in half-second intervals)	Port is faulty.	Check the management interface and the error log for details on the cause of status. Contact Technical Support if required.
	Steady amber (for more than five seconds)	Port is receiving light or signal carrier at 4 Gbps; but is not yet online.	No action required.

POST and boot specifications

When the switch is turned on or rebooted, the switch performs POST. Total boot time with POST can be several minutes. POST can be omitted after subsequent reboots by using the **fastboot** command or entering the **diagDisablePost** command to persistently disable POST.

For more information about these commands, refer to the *Fabric OS Command Reference Manual* .

POST

The success or failure results of the diagnostic tests that run during POST can be monitored through the error log or the command line interface.

POST includes the following tasks:

1. Conducts preliminary POST diagnostics.
2. Initializes the operating system.
3. Initializes hardware.
4. Runs diagnostic tests on several functions, including circuitry, port functionality, memory, statistics counters, and serialization.

Boot

In addition to POST, boot includes the following tasks after POST is complete:

1. Performs universal port configuration.
2. Initializes links.
3. Analyzes fabric. If any ports are connected to other switches, the switch participates in a fabric configuration.
4. Obtains a domain ID and assigning port addresses.
5. Constructs unicast routing tables.
6. Enables normal port operation.

Interpreting POST results

POST is a system check that is performed each time the switch is powered on, rebooted, or reset. During POST, the LEDs flash either amber or green. Any errors that occur during POST are listed in the error log.

Complete the following steps to determine whether POST completed successfully and whether any errors were detected:

1. Verify that the switch LEDs indicate that all components are healthy.

   See the LED patterns section for descriptions and interpretations of LED patterns. If one or more LEDs do not display a healthy state, verify that the LEDs on the switch are not set to "beacon" by entering the **switchShow** command to detect if beaconing is active.
2. Verify that the switch prompt displays on the terminal of a computer workstation connected to the switch.

   If there is no switch prompt when POST completes, press **Enter**. If the switch prompt still does not display, try opening a Telnet session or accessing the switch through another management tool. If this is not successful, the switch did not successfully complete POST. Contact your switch supplier for repair.
3. Review the switch system log for errors. Any errors detected during POST are written to the system log, accessible through the **errShow** command.

   For information about all referenced commands, and on accessing the error log, refer to *Fabric OS Administrator's Guide* . For information about error messages, refer to the *Fabric OS Message Reference Manual* .

Maintaining the Brocade 5100

The Brocade 5100 does not require any regular physical maintenance and is designed for high availability and to minimize the chance of failure. It includes diagnostic tests and field-replaceable units, described in the following sections.

Installing an SFP

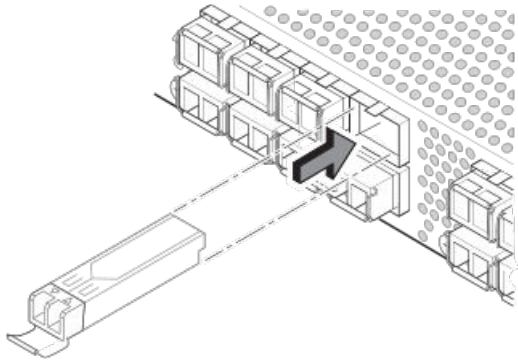
The Brocade 5100 only supports Brocade-branded SFPs. If you use an unqualified SFP, the **switchShow** command output shows the port in a Mod_Inv state. Fabric OS also logs the issue in the system error log.

Complete the following steps to install an SFP.

1. Making sure that the bail (wire handle) is in the unlocked position, place the SFP in the correctly oriented position on the port, as shown in the following figure.
2. Slide the SFP into the port until you feel it click into place; then close the bail.

NOTE
Each SFP has a 10-pad gold-plated PCB-edge connector on the bottom. The correct position to insert an SFP into the upper row of ports is with the gold edge down. The correct position to insert an SFP into the lower row of ports is with the gold edge up.

FIGURE 6 Installing an SFP in the upper row of port slot



Diagnostic tests

In addition to POST, the Fabric OS includes diagnostic tests to help you troubleshoot the hardware and firmware. This includes tests of internal connections and circuitry, fixed media, and the transceivers and cables in use.

The tests are implemented by command, either through a Telnet session or through a terminal set up for a serial connection to the switch. Some tests require the ports to be connected by external cables, to allow diagnostics to verify the serializer/deserializer interface, transceiver, and cable. Some tests require loopback plugs.

Diagnostic tests are run at link speeds of 1, 2, 4, and 8 Gbps depending on the speed of the link being tested.

NOTE
Diagnostic tests might temporarily lock the transmit and receive speed of the links during diagnostic testing.

For information about specific diagnostic tests, refer to the *Fabric OS Troubleshooting and Diagnostics Guide.*

Field Replaceable Units (FRUs)

The power supplies have the fans inside and can be replaced onsite without the use of special tools. The power supply/fan assembly units are keyed to ensure correct orientation during installation. Replacement instructions are provided with all replacement units ordered.

Power supply/fan assembly FRU replacement

The Brocade 5100 fans are fixed inside the integrated power supply/fan FRU to provide necessary airflow to cool the whole system. There is one fan located in the rear section of each FRU. The system software sets fan speed and measures their speeds through the tachometer interface.

The two power supply/fan assembly FRU units are hot-swappable if replaced one at a time. They are identical and fit into either slot.

Fabric OS identifies the power supplies as follows (viewing the switch from the *port* side):

- Power supply #1 is on the left
- Power supply #2 is on the right

Determining power supply/fan replacement need

1. Use one of the following methods to determine whether a power supply requires replacement:
   - Check the power supply status LED next to the I/O switch. If the power supply status LED is not on, verify that the power supply is on and seated and the power cord is connected to a functioning power source. If the light does not turn green, the power supply needs to be replaced.
   - In Web Tools, click the **Power Status** icon.
   - Type the **psShow** command at the command prompt to display power supply status as shown below:

```
switch:admin> psshow
Power Supply #1 is OK
Power Supply #2 is OK
```

2. Use one of the following methods to determine whether a fan requires replacement:
   - Check the system status LED (see LED locations section for location of system status LED). If the system status LED is flashing amber and green, it could mean the fan has failed. The green power supply/fan LED will also flash in the event of failure. Check the management interface and the error log for details on the cause of status.
   - In Advanced Web Tools, check the **Fan Status** icon background color. It will be either yellow or red if the fan has failed. When the fan is functioning correctly, the background color is green.
   - Type the **fanShow** command at the command prompt to display fan status as shown below:

```
switch:admin> fanshow
Fan 1 is OK, speed is 7105 RPM
Fan 2 is OK, speed is 7258 RPM
```

   For further information on replacing the power/fan units, see the Brocade 5100 *Power Supply and Fan Assembly Replacement Procedure* .

Managing the Brocade 5100

You can use the management functions built into the Brocade 5100 to monitor the fabric topology, port status, physical status, and other information to help you analyze switch performance and to accelerate system debugging.

The Brocade 5100 automatically performs power-on-self-test (POST) each time it is turned on. Any errors are recorded in the error log. For more information about POST, see POST and boot specifications on page 30.

For information about upgrading the version of Fabric OS installed on your switch, refer to the *Fabric OS Administrator's Guide.*

You can manage the Brocade 5100 using any of the management options listed in the following table.

TABLE 3 Management Options for the Brocade 5100 Switch

Management Tool	Out-of-band Support	In-band Support
Command line interface (CLI) Up to two admin sessions and four user sessions simultaneously. For more information, refer to the *Fabric OS Administrator's Guide* and the *Fabric OS Command Reference Manual* .	Ethernet or serial connection	IP over Fibre Channel
Brocade Web Tools For information, refer to the *Web Tools Administrator's Guide* .	Ethernet or serial connection	IP over Fibre Channel
Standard SNMP applications For information, refer to the *MIB Reference Manual* .	Ethernet or serial connection	IP over Fibre Channel
Brocade Fabric Manager (option to purchase) For information, refer to the *Fabric Manager Administrator's Guide* .	Ethernet or serial connection	IP over Fibre Channel
Management Server For information, refer to the *Fabric OS Administrator's Guide* and the *Fabric OS Command Reference Manual* .	Ethernet or serial connection	Native in-band interface(over HBA only)
EFCM (option to purchase) For information, refer to the EFCM documentation set.	Ethernet or serial connection	IP over Fibre Channel

NOTE
To achieve in-band support for IP over Fibre Channel, the software must be run on both the HBA and the switch, and it must be supported by both the HBA and HBA driver.

Removal and Replacement of Combined Power Supply and Fan Assembly (Port-side Air Exhaust)

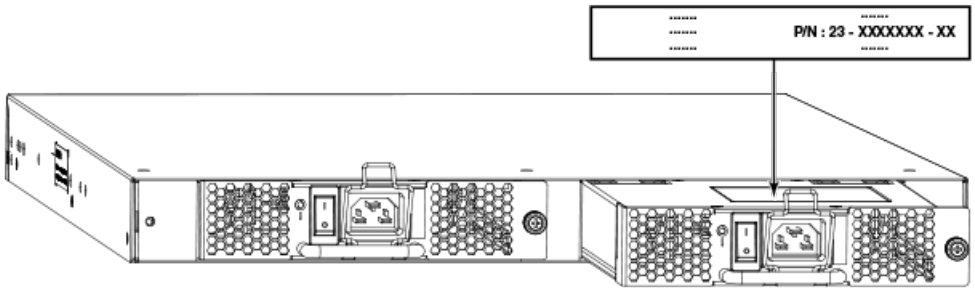
Before beginning installation

This section describes how to change a power supply/fan assembly for a unit with a port-side air exhaust. A new power supply/fan assembly field replaceable unit (FRU) must have the same part number (P/N) as the FRU being replaced. The manufacturing P/N is located on the top of the power supply/fan assembly.

The fans inside a power supply/fan assembly FRU either intake air or exhaust air from the chassis, depending on the model. If your FRU requires port-side air intake, refer to the Combined Power Supply and Fan Assembly Replacement Procedure for Port-side Air Intake. In addition to the part number, port-side intake assemblies are also identified by a green label with an E on it.

Using the same P/N for all power supply/fan assembly FRUs ensures identical airflow for all the FRUs on the chassis. The power supply/fan assembly unit handle color is also an indicator of the model type. The handles for the installed FRUs must be the same color.

FIGURE 7 Power supply and fan assembly with part number



Installing a combined power supply and fan assembly FRU

The following figure shows the two combined power supply and fan assemblies. Fabric OS identifies the FRUs from left to right as fan assembly #2 and fan assembly #1.

FIGURE 8 Power supply and fan assemblies on the non-port side

Disassembling any part of the power supply and fan assembly voids the warranty and regulatory certifications. There are no user-serviceable parts inside the power supply and fan assembly.

CAUTION

Changes or modifications made to this device that are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Because the cooling system relies on pressurized air, do not leave any of the fan assembly slots empty longer than two minutes while the switch is operating. If a fan assembly fails, leave it in the switch until it can be replaced. Maintain all fan assemblies in operational condition to provide redundancy.

CAUTION

If you do not install a module or a power supply in a slot, you must keep the slot filler panel in place. If you run the chassis with an uncovered slot, the system will overheat.

The following table describes the power supply/fan assembly status LED colors, behaviors, and actions required, if any.

TABLE 4 LED behavior, description, and required actions

LED color and behavior	Description	Action required
No light	Power supply and fan assembly is not receiving power.	Verify that the power supply and fan assembly FRU is seated correctly.
Steady green	Power supply and fan assembly is operating normally.	No action required.
Flashing green (for more than five seconds)	A power supply and fan assembly fault has occurred for one of the following reasons: • The power supply or fan in the assembly has failed. • The FRU was disabled by a user. • The FRU power switch has been turned off or the unit has been unplugged.	Take one of the following actions: • Replace the FRU. • Verify that the power supply/fan assembly FRU is enabled. • Check the power switch and plug.

Time required

Replacing a fan assembly in the switch should take less than two minutes.

Items required

You need the following items to replace a power supply and fan assembly.

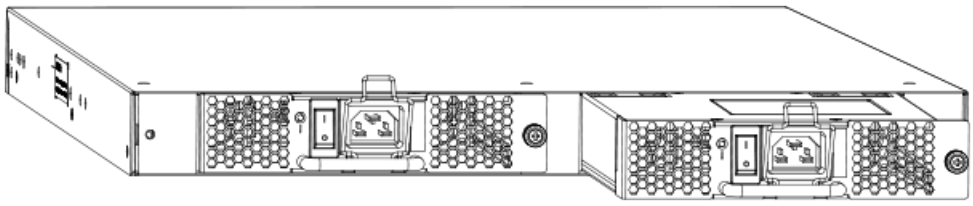
- New power supply and fan assembly FRU.
- Phillips-head screwdriver #1.

Replacing the power supply/fan assembly

Complete the following steps to replace a power supply and fan assembly.

1. Unscrew the captive screw on the power supply/fan assembly you are replacing using a Phillips-head screwdriver.
2. Remove the power supply/fan assembly from the chassis by pulling the handle out, away from the chassis.
3. Confirm that the new power supply/fan assembly has the same part number as the removed one.
4. Install the new power supply/fan assembly in the chassis:
   a) Orient the new fan assembly as shown in the following figure, with the captive screw on the right.

FIGURE 9 Orientation of the power supply and fan assembly FRU



   b) Gently push the power supply/fan assembly into the chassis until it is firmly seated.

NOTE
Do not force the installation. If the FRU does not slide in easily, ensure that it is correctly oriented before continuing.

CAUTION
Carefully follow the mechanical guides on each side of the power supply slot and make sure the power supply is properly inserted in the guides. Never insert the power supply upside down.

   c) Secure the power supply/fan assembly to the chassis by screwing in the captive screw using the Phillips-head screwdriver.
5. Verify that the fan status LED is lit steady green to indicate normal operation.
6. Optionally, display the fan status using the **fanShow** command from the CLI.

Brocade 5100 Technical Specifications

This document highlights the features and specifications for the Brocade 5100 switches.

System specifications

System component	Description
Enclosure	Non-port to port side airflow; 1U form factor, power from non-port side
Power inlet	C13
Power supplies	Dual, hot-swappable redundant power supplies with integrated system cooling fans
Fans	Two fans
Cooling	Integrated system cooling fans
System architecture	Nonblocking shared-memory switch
System processors	Power PC 440EPX and 667 MHz CPU

Fibre Channel

System component	Description
Fibre Channel ports	Switch mode (default): 24-, 32-, and 40-port configurations (8-port increments through Ports on Demand licenses); universal (E, F, M, EX, FL) ports Access Gateway default port mapping: 32 F_Ports, 8 N_Ports
ANSI Fibre Channel protocol	FC-PH (Fibre Channel Physical and Signaling Interface standard)
Modes of operation	Fibre Channel Class 2 and Class 3
Fabric initialization	Complies with FC-SW-3 Rev. 6.6
FCIP (IP over Fibre Channel)	Complies with FC-IP 2.3 of FCA profile
Port Status	40 port status LEDs

LEDs

System component	Description
Switch status and management	One system status LED (above) on the left side One power status LED (below) on the left side 40 port status LEDs, one for each Fibre Channel port, located above the ports One power supply status LED on each power supply FRU, to the left of the ON/OFF rocker switch on the non-port side of the switch

Other

System component	Description
Serial Cable	RJ-45 connector cable
RJ-45 to DB9 adaptor	RJ-45 to DB9 for console cable
RJ-45 connector	10/100 Ethernet management port; in-band over Fibre Channel; serial port (RJ-45)

Weight and physical dimensions

Model	Height	Width	Depth	Weight
Brocade 5100	4.3 cm	42.9 cm	61 cm	9.3 kg
	1.7 inches	16.9 inches	24 inches	20.6 inches

Environmental requirements

Condition	Operational	Non-operational
Ambient temperature	0°C to 40°C (32°F to 104°F)	-25°C to 70°C (-13°F to 158°F)
Relative humidity (non-condensing)	10% to 85% at 40°C (104°F)	10% to 95 % at 70°C (158°F)
Altitude (above sea level)	0 to 3000 m (10,000 feet)	0 to 12000 m (40,000 feet)
Shock	20 G, 6 ms, half-sine wave	33 G, 11 ms, half-sine wave, 3/eg Axis
Vibration	0.5 G sine, 0.4 gms random, 5-500 Hz	2.0 G sine, 1.1 gms random, 5-500 Hz

Condition	Operational	Non-operational
Airflow	Maximum: 49.3 cmh (29 cfm) Nominal: 37.4 cmh (22 cfm)	N/A
Heat dissipation	311 BTU/hr (Maximum 40 ports)	N/A

Power supply specifications (per PSU)

Power supply model	Maximum output power rating (DC)	Input voltage	Input line frequency	Maximum input current	Input line protection	Maximum inrush current
Not available	150 W	100 - 240 V (nominal) 85 - 264 V (range)	50/60 Hz (nominal) 47 - 63 Hz (range)	16 A	Both AC lines fused	35 A

Power consumption

110 W with all 48 ports populated with 16 Gbps SWL optics.

72 W with empty chassis and no optics.

Data port specifications (Fibre Channel)

Name	Number	Description
Brocade 5100	1, 2 , 4 and 8 Gbps	Configurations of 24, 32, or 40 ports in an efficiently designed 1U package

Fibre Channel data transmission ranges

Port speed (Gbps)	Cable size (microns)	Short wavelength (SWL)	Long wavelength (LWL)	Extended long wavelength (ELWL)
1	50	500 m (1,640 feet) (OM2); 860 m (2,821 feet) (OM3)	N/A	N/A
	62.5	300 m (984 feet)	N/A	N/A
	9	N/A	10 km (6.2 miles)	80 km (50 miles)

Port speed (Gbps)	Cable size (microns)	Short wavelength (SWL)	Long wavelength (LWL)	Extended long wavelength (ELWL)
2	50	300 m (984 feet) (OM2); 500 m (1,640 feet) (OM3)	N/A	N/A
	62.5	150 m (492 feet)	10 km (6.2 miles)	80 km (50 miles)
	9	N/A	10 km (6.2 miles)	80 km (50 miles)
4	50	150 m (492 feet) (OM2); 380 m (1,246 feet) (OM3)	N/A	N/A
	62.5	70 m (230 feet)	N/A	N/A
	9	N/A	N/A	N/A
8	50	50 m (164 feet) (OM2); 150 m (492 feet) (OM3)	N/A	N/A
	62.5	21 m (69 feet)	N/A	N/A
	9	N/A	10 km	N/A

Serial port specifications (pinout RJ-45)

Pin	Signal	Description
1	Not supported	N/A
2	Not supported	N/A
3	UART1_TXD	Transmit data
4	GND	Logic ground
5	GND	Logic ground
6	UART1_RXD	Receive data
7	Not supported	N/A
8	Not supported	N/A

Serial port specifications (protocol)

Parameter	Value
Baud	9600
Data bits	8
Parity	None
Stop bits	1
Flow control	None

Memory specifications

Memory	Type	Size
Main memory	SDRAM	512 MB
Boot Flash		4 MB
Compact Flash		1 GB

Regulatory compliance (EMC)

- ANSI C63.4
- ICES-003 Class A
- CISPR22 and JEIDA
- EN55022 and EN55024
- EN55022 or CISPR22 or AS/NZS CISPR22
- 51318.22-99 and 51318.24.99
- KN22 and KN24
- GB17625.1-2003
- CNS 13438(95)

Regulatory compliance (immunity)

- EN50082-2/EN55024:1998 (European Immunity Requirements)

- EN61000-3-2/JEIDA (European and Japanese Spec)
- EN61000-3-3

Regulatory compliance (safety)

- Bi-Nat UL/CSA 60950-1
- EN 60950-1
- IEC 60950-1
- GB4943-2001 and GB9254-1998
- CNS 14336(94)

Regulatory compliance (environmental)

- 2011/65/EU - Restriction of the use of certain hazardous substance in electrical and electronic equipment (EU RoHS).
- 2012/19/EU - Waste electrical and electronic equipment (EU WEEE).
- 94/62/EC - packaging and packaging waste (EU).
- 2006/66/EC - batteries and accumulators and waste batteries and accumulators (EU battery directive).
- 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (EU REACH).
- Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 - U.S. Conflict Minerals.
- 30/2011/TT-BCT - Vietnam circular.
- SJ/T 11363-2006 Requirements for Concentration Limits for Certain Hazardous Substances in EIPs (China).
- SJ/T 11364-2006 Marking for the Control of Pollution Caused by EIPs (China).

Regulatory Statements

BSMI statement (Taiwan)

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，
在這種情況下，使用者會被要求採取某些適當的對策。

Warning:

This is Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Canadian requirements

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations, ICES-003 Class A.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

CE Statement

ATTENTION
This is a Class A product. In a domestic environment, this product might cause radio interference, and the user might be required to take corrective measures.

The standards compliance label on this device contains the CE mark which indicates that this system conforms to the provisions of the following European Council directives, laws, and standards:

- Electromagnetic Compatibility (EMC) Directive 2004/108/EEC
- Low Voltage Directive (LVD) 2006/95/EC
- EN50082-2/EN55024:1998 (European Immunity Requirements)

- EN61000-3-2/JEIDA (European and Japanese Harmonics Spec)
- EN61000-3-3

China CC statement

China-CCC Warning statements

在维修的时候一定要断开所有电源 (English translation"disconnect all power sources before service")

For non tropical use:

安全说明和标记	汉文	"仅适用于非热带气候条件下安全使用。"
	藏文	[illegible]
	蒙古文	"ᠲᠤᠨᠳᠠᠷᠠᠯᠭᠤᠢ ᠭᠠᠵᠠᠷ ᠤᠨ ᠤᠯᠤᠰ ᠤᠨ ᠭᠠᠵᠠᠷ ᠲᠤ ᠵᠥᠪᠬᠡᠨ ᠠᠰᠠᠭᠤᠵᠤ ᠬᠡᠷᠡᠭᠯᠡᠬᠦ ᠪᠠᠢᠳᠠᠯ ᠲᠠᠢ"
	壮文	Dan hab yungh youq gij dienheiq diuzgen mbouj dwg diegndat haenx ancienz sawjyungh.
	维文	غەيرى ئىسسىق بەلباغ ھاۋا كىلىمانى شارائىتىدىلا بىخەتەر ئىشلەتكىلى بولىدۇ

For altitude 2000 meter and below:

安全说明和标记	汉文	仅适用于海拔2000m以下地区安全使用。
	藏文	[illegible]
	蒙古文	"ᠳᠤᠤᠭᠠᠷᠢᠨ ᠳᠡᠷᠡᠪᠡᠷ ᠠᠪᠤᠭᠰᠠᠨ ᠳᠡᠭᠡᠭᠰᠢ 2000ᠮᠠᠲ ᠤᠨ ᠭᠠᠵᠠᠷ ᠲᠤ ᠵᠥᠪᠬᠡᠨ ᠠᠰᠠᠭᠤᠵᠤ ᠬᠡᠷᠡᠭᠯᠡᠬᠦ ᠪᠠᠢᠳᠠᠯ ᠲᠠᠢ"
	壮文	Dan hab yungh youq gij digih haijbaz 2000m doxroengz haenx ancienz sawjyungh.
	维文	دېڭىز يۈزىدىن 2000 مېتر تۆۋەن رايونلاردىلا بىخەتەر ئىشلەتكىلى بولىدۇ

Warning for Class A:

声 明

此为 A 级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

English translation of above statement

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

China ROHS

Refer to the latest revision of the China ROHS document (P/N 53-1000428-xx) which ships with the product.

FCC warning (US only)

This equipment has been tested and complies with the limits for a Class A computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, might cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's own expense.

KCC statement (Republic of Korea)

A급 기기 (업무용 방송통신기기): 이 기기는 업무용(A급)으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

Class A device (Broadcasting Communication Device for Office Use): This device obtained EMC registration for office use (Class A), and may be used in places other than home. Sellers and/or users need to take note of this.

VCCI statement

この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI－A

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance might arise. When such trouble occurs, the user might be required to take corrective actions.

Cautions and Danger Notices

Cautions

A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

Ein Vorsichthinweis warnt Sie vor potenziellen Personengefahren oder Beschädigung der Hardware, Firmware, Software oder auch vor einem möglichen Datenverlust

Un message de mise en garde vous alerte sur des situations pouvant présenter un risque potentiel de dommages corporels ou de dommages matériels, logiciels ou de perte de données.

Un mensaje de precaución le alerta de situaciones que pueden resultar peligrosas para usted o causar daños en el hardware, el firmware, el software o los datos.

General cautions

CAUTION

Changes or modifications made to this device that are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

VORSICHT	Falls dieses Gerät verändert oder modifiziert wird, ohne die ausdrückliche Genehmigung der für die Einhaltung der Anforderungen verantwortlichen Partei einzuholen, kann dem Benutzer der weitere Betrieb des Gerätes untersagt werden.
MISE EN GARDE	Les éventuelles modifications apportées à cet équipement sans avoir été expressément approuvées par la partie responsable d'en évaluer la conformité sont susceptibles d'annuler le droit de l'utilisateur à utiliser cet équipement.
PRECAUCIÓN	Si se realizan cambios o modificaciones en este dispositivo sin la autorización expresa de la parte responsable del cumplimiento de las normas, la licencia del usuario para operar este equipo puede quedar anulada.

CAUTION

Do not install the device in an environment where the operating ambient temperature might exceed 40°C (104°F).

VORSICHT	Das Gerät darf nicht in einer Umgebung mit einer Umgebungsbetriebstemperatur von über 40°C (104°F) installiert werden.
MISE EN GARDE	N'installez pas le dispositif dans un environnement où la température d'exploitation ambiante risque de dépasser 40°C (104°F).
PRECAUCIÓN	No instale el instrumento en un entorno en el que la temperatura ambiente de operación pueda exceder los 40°C (104°F).

CAUTION

Make sure the airflow around the front, sides, and back of the device is not restricted.

VORSICHT	Stellen Sie sicher, dass an der Vorderseite, den Seiten und an der Rückseite der Luftstrom nicht behindert wird.
MISE EN GARDE	Vérifiez que rien ne restreint la circulation d'air devant, derrière et sur les côtés du dispositif et qu'elle peut se faire librement.
PRECAUCIÓN	Asegúrese de que el flujo de aire en las inmediaciones de las partes anterior, laterales y posterior del instrumento no esté restringido.

CAUTION

Ensure that the airflow direction of the power supply unit matches that of the installed fan tray. The power supplies and fan trays are clearly labeled with either a green arrow with an "E", or an orange arrow with an "I."

VORSICHT	Vergewissern Sie sich, dass die Luftstromrichtung des Netzteils der eingebauten Lüftereinheit entspricht. Die Netzteile und Lüftereinheiten sind eindeutig mit einem grünen Pfeil und dem Buchstaben "E" oder einem orangefarbenen Pfeil mit dem Buchstaben "I" gekennzeichnet.
MISE EN GARDE	Veillez à ce que le sens de circulation de l'air du bloc d'alimentation corresponde à celui du tiroir de ventilation installé. Les blocs d'alimentation et les tiroirs de ventilation sont étiquetés d'une flèche verte avec un "E " ou d'une flèche orange avec un " I ".
PRECAUCIÓN	Asegúrese de que la dirección del flujo de aire de la unidad de alimentación se corresponda con la de la bandeja del ventilador instalada. Los dispositivos de alimentación y las bandejas del ventilador están etiquetadas claramente con una flecha verde y una "E" o con una flecha naranja y una "I".

Electrical cautions

CAUTION

Before plugging a cable into to any port, be sure to discharge the voltage stored on the cable by touching the electrical contacts to ground surface.

VORSICHT	Bevor Sie ein Kabel in einen Anschluss einstecken, entladen Sie jegliche im Kabel vorhandene elektrische Spannung, indem Sie mit den elektrischen Kontakten eine geerdete Oberfläche berühren.
MISE EN GARDE	Avant de brancher un câble à un port, assurez-vous de décharger la tension du câble en reliant les contacts électriques à la terre.
PRECAUCIÓN	Antes de conectar un cable en cualquier puerto, asegúrese de descargar la tensión acumulada en el cable tocando la superficie de conexión a tierra con los contactos eléctricos.

CAUTION

Static electricity can damage the chassis and other electronic devices. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

VORSICHT	Statische Elektrizität kann das System und andere elektronische Geräte beschädigen. Um Schäden zu vermeiden, entnehmen Sie elektrostatisch empfindliche Geräte erst aus deren antistatischer Schutzhülle, wenn Sie bereit für den Einbau sind.
MISE EN GARDE	L'électricité statique peut endommager le châssis et les autres appareils électroniques. Pour éviter tout dommage, conservez les appareils sensibles à l'électricité statique dans leur emballage protecteur tant qu'ils n'ont pas été installés.
PRECAUCIÓN	La electricidad estática puede dañar el chasis y otros dispositivos electrónicos. A fin de impedir que se produzcan daños, conserve los dispositivos susceptibles de dañarse con la electricidad estática dentro de los paquetes protectores hasta que esté listo para instalarlos.

CAUTION

If you do not install a module or a power supply in a slot, you must keep the slot filler panel in place. If you run the chassis with an uncovered slot, the system will overheat.

VORSICHT	Falls kein Modul oder Netzteil im Steckplatz installiert wird, muss die Steckplatztafel angebracht werden. Wenn ein Steckplatz nicht abgedeckt wird, läuft das System heiß.
MISE EN GARDE	Si vous n'installez pas de module ou de bloc d'alimentation dans un slot, vous devez laisser le panneau du slot en place. Si vous faites fonctionner le châssis avec un slot découvert, le système surchauffera.
PRECAUCIÓN	Si no instala un módulo o un fuente de alimentación en la ranura, deberá mantener el panel de ranuras en su lugar. Si pone en funcionamiento el chasis con una ranura descubierta, el sistema sufrirá sobrecalentamiento.

CAUTION

Carefully follow the mechanical guides on each side of the power supply slot and make sure the power supply is properly inserted in the guides. Never insert the power supply upside down.

VORSICHT	Beachten Sie mechanischen Führungen an jeder Seite des Netzteils, das ordnungegemäß in die Führungen gesteckt werden muss. Das Netzteil darf niemals umgedreht eingesteckt werden.
MISE EN GARDE	Suivez attentivement les repères mécaniques de chaque côté du slot du bloc d'alimentation et assurez-vous que le bloc d'alimentation est bien inséré dans les repères. N'insérez jamais le bloc d'alimentation à l'envers.
PRECAUCIÓN	Siga cuidadosamente las guías mecánicas de cada lado de la ranura del suministro de energía y verifique que el suministro de energía está insertado correctamente en las guías. No inserte nunca el suministro de energía de manera invertida.

Danger Notices

A Danger statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Ein Gefahrenhinweis warnt vor Bedingungen oder Situationen die tödlich sein können oder Sie extrem gefährden können. Sicherheitsetiketten sind direkt auf den jeweiligen Produkten angebracht um vor diesen Bedingungen und Situationen zu warnen.

Un paragraphe Danger indique des conditions ou des situations potentiellement mortelles ou extrêmement dangereuses. Des labels de sécurité sont posés directement sur le produit et vous avertissent de ces conditions ou situations

Una advertencia de peligro indica condiciones o situaciones que pueden resultar potencialmente letales o extremadamente peligrosas. También habrá etiquetas de seguridad pegadas directamente sobre los productos para advertir de estas condiciones o situaciones.

General dangers

DANGER

The procedures in this manual are for qualified service personnel.

GEFAHR	Die Vorgehensweisen in diesem Handbuch sind für qualifiziertes Servicepersonal bestimmt.
DANGER	Les procédures décrites dans ce manuel doivent être effectuées par un personnel de maintenance qualifié.
PELIGRO	Los procedimientos de este manual deben llevarlos a cabo técnicos cualificados.

Electrical dangers

DANGER

For safety reasons, the ESD wrist strap should contain a series 1 megaohm resistor.

GEFAHR	Aus Sicherheitsgründen sollte ein EGB-Armband zum Schutz von elektronischen gefährdeten Bauelementen mit einem 1 Megaohm-Reihenwiderstand ausgestattet sein.
DANGER	Pour des raisons de sécurité, la dragonne ESD doit contenir une résistance de série 1 méga ohm.
PELIGRO	Por razones de seguridad, la correa de muñeca ESD deberá contener un resistor en serie de 1 mega ohmio.

DANGER

Make sure that the power source circuits are properly grounded, then use the power cord supplied with the device to connect it to the power source.

GEFAHR	Stellen Sie sicher, dass die Stromkreise ordnungsgemäß geerdet sind. Benutzen Sie dann das mit dem Gerät gelieferte Stromkabel, um es an die Srromquelle anzuschließen.
DANGER	Vérifiez que les circuits de sources d'alimentation sont bien mis à la terre, puis utilisez lecordon d'alimentation fourni avec le dispositif pour le connecter à la source d'alimentation.
PELIGRO	Verifique que circuitos de la fuente de corriente están conectados a tierra correctamente; luego use el cordón de potencia suministrado con el instrumento para conectarlo a la fuente de corriente

DANGER

Remove both power cords before servicing.

GEFAHR	Trennen Sie beide Netzkabel, bevor Sie Wartungsarbeiten durchführen.
DANGER	Retirez les deux cordons d'alimentation avant toute maintenance.
PELIGRO	Desconecte ambos cables de alimentación antes de realizar reparaciones.

DANGER

Disconnect the power cord from all power sources to completely remove power from the device.

GEFAHR	Ziehen Sie das Stromkabel aus allen Stromquellen, um sicherzustellen, dass dem Gerät kein Strom zugeführt wird.
DANGER	Débranchez le cordon d'alimentation de toutes les sources d'alimentation pour couper complètement l'alimentation du dispositif.
PELIGRO	Para desconectar completamente la corriente del instrumento, desconecte el cordón de corriente de todas las fuentes de corriente.

DANGER

To avoid high voltage shock, do not open the device while the power is on.

GEFAHR	Das eingeschaltete Gerät darf nicht geöffnet werden, da andernfalls das Risiko eines Stromschlags mit Hochspannung besteht.
DANGER	Afin d'éviter tout choc électrique, n'ouvrez pas l'appareil lorsqu'il est sous tension.
PELIGRO	Para evitar una descarga de alto voltaje, no abra el dispositivo mientras esté encendido.

DANGER

Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

GEFAHR	Es besteht Explosionsgefahr, wenn ein unzulässiger Batterietyp eingesetzt wird. Verbrauchte Batterien sind entsprechend den geltenden Vorschriften zu entsorgen.
DANGER	Risque d'explosion en cas de remplacement de la pile par un modèle incorrect. Débarrassez-vous des piles usagées conformément aux instructions.
PELIGRO	Riesgo de explosión si se sustituye la batería por una de tipo incorrecto. Deshágase de las baterías usadas de acuerdo con las instrucciones.

Dangers related to equipment weight

DANGER

Make sure the rack housing the device is adequately secured to prevent it from becoming unstable or falling over.

GEFAHR	Stellen Sie sicher, dass das Gestell für die Unterbringung des Geräts auf angemessene Weise gesichert ist, so dass das Gestell oder der Schrank nicht wackeln oder umfallen kann.
DANGER	Vérifiez que le bâti abritant le dispositif est bien fixé afin qu'il ne devienne pas instable ou qu'il ne risque pas de tomber.
PELIGRO	Verifique que el bastidor que alberga el instrumento está asegurado correctamente para evitar que pueda hacerse inestable o que caiga.

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